DOCUMENT RESUME

ED 299 975 IR 052 423

AUTHOR Neelameghan, A.
TITLE Learning about and Practice of Designing Local Data Bases as an Harmonizing Factor.
INSTITUTION International Federation of Library Associations, The Hague (Netherlands).
PUB DATE Aug 87
NOTE 15p.; Paper presented at the International Federation of Library Associations (IFLA) Pre-Session Seminar on International Colloquium on Education and Training of Library, Information and Archival Personnel (London, England, August 10-14, 1987).
PUB TYPE Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Computer Software; Computer System Design; Database Management Systems; *Databases; Developing Nations; Human Resources; *Information Retrieval; *Information Storage; *Information Systems; Library Automation; Library Services; *Professional Training; Technological Advancement
IDENTIFIERS *India (Bangalore); Prototypes

ABSTRACT

This paper provides information workers with some practical approaches to the design, development, and use of local databases that form components of information storage and retrieval systems (ISR) and of automated library operations. Topics discussed include: (1) course objectives for the design and development of local databases for library and information science (LIS) personnel; (2) use of off-the-shelf software; (3) database design as an integrated process, based on knowledge gained in several modules of an information studies program; (4) library documentation techniques and their usefulness in information technology application; (5) integrated information systems (IIS); and (6) prototypes of information databases and information storage and retrieval systems including LIST; the Integrated Information System, a medical ISR made up of PREMA and SYNDRO; and university-designed prototypes. (3 references) (CGD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

PRES SESSION SEMINAR ON INTERNATIONAL
COLLOQUIUM ON EDUCATION AND TRAINING OF
LIBRARY, INFORMATION AND ARCHIVAL PERSONNEL.
LONDON 10-14 August 1987

1987

107-PRESESSION-2-E

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

ED299975

LEARNING ABOUT AND PRACTICE OF DESIGNING LOCAL DATA BASES AS AN HARMONIZING FACTOR

BY

A. NEELAMEGHAN, Honorary visiting professor,
Documentation Research & Training Centre, Indian Statistical Institute
Bangalore, India

IR052423

KEYWORD(S):

For internal use only: (SI)
To be brought to meeting no:

Remarks:
to be presented orally ☒
for distribution only ☐

BEST COPY AVAILABLE

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
A.L.Van Wesemael
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

LEARNING ABOUT AND PRACTICE OF DESIGNING LOCAL DATA BASES AS AN HARMONIZING FACTOR

"DATA BASE" IN INFORMATION STUDIES SYLLABUS

01 Data base is a basic component of information storage and retrieval systems and of automated library operations (acquisitions management, serials control, circulation control, etc.). Hence, acquiring knowledge and practical skills for the design, development and use of data bases is essential to information personnel to enable them apply information technology in library, documentation and information work.

02 The topic "data base", if not a full course module by itself, may be found included in one or more course modules in library/information science (LIS). Examples are: "Information sources", "Information technology", "Information storage and retrieval systems" and so on. In each of these modules the "data base" is considered from different angles.

SCOPE OF THE PAPER

03 This paper is concerned with the design, development and use of "local" data bases that form components of information storage and retrieval systems. More specifically it deals with some practical approaches to help trainees acquire basic skills helful for designing a wide range of data bases and emphasizes, based on experience, that learning about and practice of designing and designing data base could help to provide trainees an integrative and harmonized view of elements in different course modules in LIS on the one hand and to realize that the techniques, tools and procedures, used in designing data bases are similar in library, docu-

LEARNING ABOUT AND PRACTICE OF DESIGNING LOCAL DATA BASES AS AN HARMONIZING FACTOR

by

A. Neelameghan*

ABSTRACT

Data base is a basic component of information storage and retrieval (ISR) systems and of automated library operations. Acquiring knowledge and practical skills for the design, development & use of data bases is essential to information workers. In library and information science (LIS) courses the topic "data bases" is found included and treated from different view points in more than one module. The design, development and use of data bases in ISR systems require the application of knowledge and skills gained in the different areas, such as, cataloguing and bibliographic desctiption; documentation standards & norms; content analysis, facet analysis and classification; abstracting, indexing and vocabulary control; analysis of systems, organizations & user requirements; searching techniques. Thus, data base/ISR system design exercises could provide an integrated of the subjects dispersed in several courses. In training LIS personnel it will be useful (1) to develop skills for designing bibliographic and non-bibliographic data bases; (2) to emphasize designing integrated systems; and (3) to use prototypes of data bases and ISR systems as learning and teaching aids. Gives examples of prototypes of data bases and integrated systems prepared and used in LIS courses.

---

*Honorary Visiting Professor, Documentation Research & Training Centre, Indian Statistical Institute, Mysore Road, 8th Mile, R.V. College Post, Bangalore 560059, India.

cataloguing, record formats and related standards; content analysis, facet analysis, classification; abstracting and indexing; vocabulary control and thesaurus; study of the needs and requirements of different category of users; search techniques, etc. In this respect practice of data base design and development is also useful in providing an integrated view of the elements dispersed in the different course modules.

THREE ASPECTS

07 In training to design and develop local data bases it would be useful (1) to develop skills for designing bibliographic and non-bibliographic data bases, (2) to place some emphasis on designing integrated data bases and systems, and (3) to use as learning and teaching aids proto-types of data bases and ISRs.

08 Why non-bibliographic data bases as well in LIS courses? Any serious human endeavour, be it research, or management, planning, problem-solving, executing a task requires different kinds of resources: human resource, knowledge and know-how, finance, equipment and facilities. An information system or service intended to support such an endeavour should provide to those involved in the endeavour information and data on such resources. Information and data would be needed on such aspects as the following:

- the various options in each resource category
- alternative sources for the resource entities
- experiences of using the resources in similar contexts
- the characteristics and qualities of each of the resources to those who use the resources
- the conditions of availability of the resource entities
- the current and potential users of the resource entities

mentation, information and archives management work.

04 With the wider availability of increasingly more powerful and relatively less expensive microcomputers and good portable software packages - data base management system software and applications software - libraries and information centres in developing countries are able to acquire and use them. Also, microcomputers enable LIS schools to provide for more extensive practice/hands-on experience in information technology applications. Therefore, data base design and development using microcomputers is another bias in this paper.

USE OF OFF-THE-SHELF SOFTWARE

05 A trend in recent years in the training of LIS personnel is to provide them the knowlege and skills to use ready-made/or off-the-shelf software (DBMS and applications software) rather than on training them extensively in computer programming and development of software except in advanced and specialized courses in information technology. Formulation and application of criteria for the selection of software and hardware for ISR, library applications and to participate in networks is an important topic in library/information management courses. Also, practical work of comparative study of applications software for data base and ISR systems design and development is very useful.

DATA BASE DESIGN PROVIDES INTEGRATED VIEW

06 The theory and practice of designing, developing, maintaining and using data base as component of information storage and retrieval (ISR) systems has to draw upon the knowledge gained in several modules of an information studies programme: For example

- whom to contact and how best to obtain the needed resources

09 Information on the different resources may be found in or be obtained from, different sources. For example:

Knowledge and know-how	:Documents; specialists; projects; projects; events
Human resources	:Documents; profiles of experts/ expertise/skills, institutions, projects and events where human resources are generated, provided or used.
Equipment and facilities	:Documents; institutions, projects, events where equipment and facilities are used or made available.
Finance	:Institutions and organizations that provide funds; projects and that receive funds or which use funds.

10 If in response to a query regarding an equipment, the information system not provides reference to documents containing information on the equipment but also indicates where the equipment is being used or from where it could be procured, it would be of added value to the user. Similarly, in response to a user's query on a specialized subject the system not only cites reference to documents but also presents profiles of projects on that subject, of institutions and experts in that field, it would be of greater help to the user. Therefore, in order to provide more comprehensive information, information with added value, the information system should have data bases not only of bibliographical records but also profiles of institutions, projects, persons, events, and so on in the fields of interest to the user groups served.

INFORMATION TECHNOLOGY AS A HARMONIZING FACTOR

11 Libraries normally provide documentary information or biblio-

graphical reference. The preparation of information sources such as compilations of profiles of institutions, projects, expertise, etc. was left to others, to be produced in document form. Information technology applications is changing the situation. One and the same software can be used in the creation of a wide range of data bases - of documents, profiles of persons, projects, institutions, events, and a variety of directories and inventories etc. The principles and techniques to create machine-readable records about documents can be applied to create machine-readable records on institutions, projects, persons, etc. Principles, procedures, techniques and tools, such as those for cataloguing, classification, indexing, vocabulary control, and others developed and used in library and documentation work are equally applicable in designing and developing data bases and ISRs of non-documentary entities. Therefore, the demarcation line between bibliographic data bases and other types of data bases in respect of the principles, techniques and tools that may be used in their design and development is disappearing. Further, the library/documentation unit is able to create and maintain a range of data bases as infoirmation sources and thus enhance its capacity to provide more comprehensive, value added information, than would otherwise be possible. The possibilities are many. Some experiences are mentioned later in this paper.

12 This should be reflected in the training of information professionals. A person so trained would be able (1) to design, develop and maintain different types of data bases and provide services based on them; or (2) to design and develop such systems and to train others in the institution in maintaining them and provide

services; or (3) to train others to design, develop, maintain and to provide services with, the systems. In any case, the library/documentation techniques are seen to be of greater usefulness in information technology applications. Consequently the perception about and image of the library/documentation facility and of the professionals associated with it improves.

INTEGRATED SYSTEMS

13 An approach to designing an ISR system that can provide information on the different resource entities mentioned in section 08 and enables more efficient use of human and computer resources of the system is to develop a integrated information system based on an integrated data base.

14 An integrated information system (IIS) based on or using several separate data bases or a single master data base integrating in it several data bases or a combination of these two types of data bases, can provide a wider range of information by searching sucessively or simultaneously several data bases or a single data base in which several data bases are integrated.

15 An IIS can provide different types of services based on the different data bases, for example, current awareness and SDI, retrospective search, referral etc., and can present the retrieved information/records in different formats to suit the convenience of users.

16 Integration across functions or processes can contribute to the optimization of human and computer resources. For example, a document record entered into the system may be given a bibliographic description at the time it is proposed for acquisition. The

elements in the description can be manipulated by machine - added to, updated, or deleted, as necessary, at various stages of the acquisition process, accessioning, cataloguing, etc., and finally cumulated into the data base as the basis for generating various administrative reports, information services, union lists/catalogues, and other directories. Different types of indexes can also be generated automatically.

17 An organization may develop small diverse information systems to meet diverse user needs in diverse locations. Similar or same data may be specified differently in the different systems resulting in incompatibility across applications that use the data. A user wanting to perform analysis using data obtained from two or more of the systems would find the task difficult because of the incompatibility of data. Redundant and unnecessary development of separate applications where a single application can serve more than one need could result in non-optimal use of the computer and human resources.

18 In an integrated system all access to and use of the data base is managed through a data base management system. Every application utilizing a particular data access the same data stored in one location. A single updating of a data item updates it for all users. The system facilitates application of norms and standards, and therefore ensures greater compatibility among the systems. It facilitates exchange of data bases and of subsets of data bases. Multiple use of same data/data base facilitates resource sharing among the systems. Distributed data processing is also facilited enhancing the possibilities of optimal use of computing and human resources. Merging of different data bases or simultaneous

access to different data bases and systems supports provision of different types of services to users.

19 Therefore, in training/documentation/information professionals it is important to point out the advantages of IIS and to develop their skills to design such systems.

20 A procedure for designing an IIS on microcomputers with case-study of a protype developed using the CDS/ISIS (mini-micro version is described in another document (1). Generation of a simple SDI service using the software is described in another paper (2).

PROTOTYPES OF INFORMATION SYSTEMS

21 Prototypes of information data bases and ISR are useful learning teaching aids. A prototype will have all or nearly all the features and capabilities of the operational version of the system, except that the component data base may have a smaller number of records. In the prototypes we have used the size of the data base ranged from 30 to 3000 records. In using prototypes the advantages are that the trainees will be handling/learning about/practising with a regular operational model of the system which they might develop or use in their respective insitutions; in the project work or assignment during the course, the trainees may design and develop prototypes of ISR which they may be able to implement in their respective institutions with minor modifications; and different software packages can be used to develop the same prototype system with a view to comparing and evaluating the capabilities and features of the software packages.

22 Some of the protypes mentioned below were developed in and/or made available to, some LIS schools/programmes and were prepared

in response to requests for operational systems or for demonstration from different institutions or user groups. The prototype is either a generalized model that can be used with or without minor modifications to meet the requirements of different institutions; or it may be a model of a system developed for a particular institution but can be used in similar other applications or institutions with only minor modifications. The prototypes discussed here were all designed and developed using the mini-micro version of CDS/ISIS software (3). Some of the prototypes were also prepared using other software such as, SUPERDOC, INMAGIC and DBASE III for comparative study of the packages.

23 Some prototypes developed and used in learning and practising design of data bases, ISR and IIS are:

(a) LIST - an integrated data base of some 300 records mostly in the field of LIS; bibliographical references (about 270), mostly with abstracts to books, articles in periodicals and proceedings of conferences, reports, and a few non-book materials, e.g. video cassettes; profiles of institutions, persons, projects and events (about 30); all integrated into a single master data base. Has an acquisitions management module, facility to generate union lists/catalogues, KWOC indexes, current awareness service, etc. A guide to the system is available (1). The prototype has been used in training and to develop specific operational ISRs.

(b) A medical ISR, designed in response to requests from a hospital and a research centre. It consists of:

- IIS (Integrated Information System), a composite data base (of the LIST model mentioned above) containing bibliographical references, profiles of institutions, persons, projects, events of

interest to the centres;

- PREMA (Patients REcords MAnagement), containing a data base of hospital case history archives; a record for each patient gives fairly detailed medical history and administrative information of the patient; the records can be retrieved and displayed in different formats; and
- SYNDRO, containing descriptions of selected syndromes - name of disease, synonyms, signs/symptoms, pathology, critical tests, treatment, prognosis, the first reports, etc. with provision to add notes/observations by the user/institution.

A query, say about a particular disease or given the signs and symptoms or pathological description, all the data bases could be searched to retrieve relevant

- bibliographical references, profiles of persons, institutions and projects from the IIS data base;
- case histories of patients of the hospital/centre from PREMA;
- a description of the disease from SYNDRO.

On the other hand, SYNDRO may be used independently as an information/learning facility by medical students.

(c) A university department of information studies that has some of the above-mentioned prototypes and developed a few others for use in its postgraduate courses carried out the following:

i) three students of the university's computer science department selected as project work the development of a microcomputer software for bibliographical information processing. First, they were given guidance and hands-on experience of using three software - CDS/ISIS (mini-micro version), INMAGIC and SUPERDOC in the department of information studies for them to understand the require-

ments of documentary ISR systems and to compare the capabilities and features of the software packages. The trainees developed a few prototype data bases for the comparative study.

ii) The department of information studies offered to develop for the university prototypes of a number of data bases and ISRs that could form components of a university information system and to train those in the university departments who would be inputting and/or use the systems. Some of the prototypes were developed by the trainees in the postgraduate course of the department. The data bases included:

- University theses and dissertations
- University research proposals and ongoing research
- Papers, reports, books by the staff of the University
- Courses of studies offered
- Profiles of university teachers and other staff
- Profiles of visiting faculty, consultants, etc.
- Profiles of institutions and organizations of interest to the University
- Fellowships and grants
- Conferences, seminars, workshops organized/supported by the University
- Inventory of computer hardware and software available in the University
- Inventory of specialized equipment
- University archives
- University contracts and agreements

and so on.

iii) Participants in the Department's post-graduate course used the prototypes to develop ISRs of interest to their respective institutions. For example:

- Company archives
- Profiles/directories of raw materials suppliers
- University archives

OTHER POSSIBILITIES

24 Softwares, such as CDS/ISIS enable the import and export or

the exchange of records or data base segments that are in compatible formats (e.g. ISO 2709). Thus records can be down-loaded or up-loaded through data communication facilities or magnetic media such as, floppy discs, cartridges, etc. The data bases thus developed would enable additional exercises to be peformed on them.

REFERENCES

1. Neelameghan, A. Designing an integrated data base using CDS/ISIS mini-micro version: a case study and a brief guide to LIST: a prototype for an integrated data base. 1987. Paris, Unesco.
2. Neelameghan, A. Designing a simple SDI service using CDS/ISIS mini-micro version (under publication)
3. CDS/ISIS mini-micro version developed by Unesco's Division of Library, Archives and Documentation Divison. Release 1.0 made available for public use early in January 1986 has been used in designing the data bases and ISRs. A more powerful version Release 2.0 of the software is now available.